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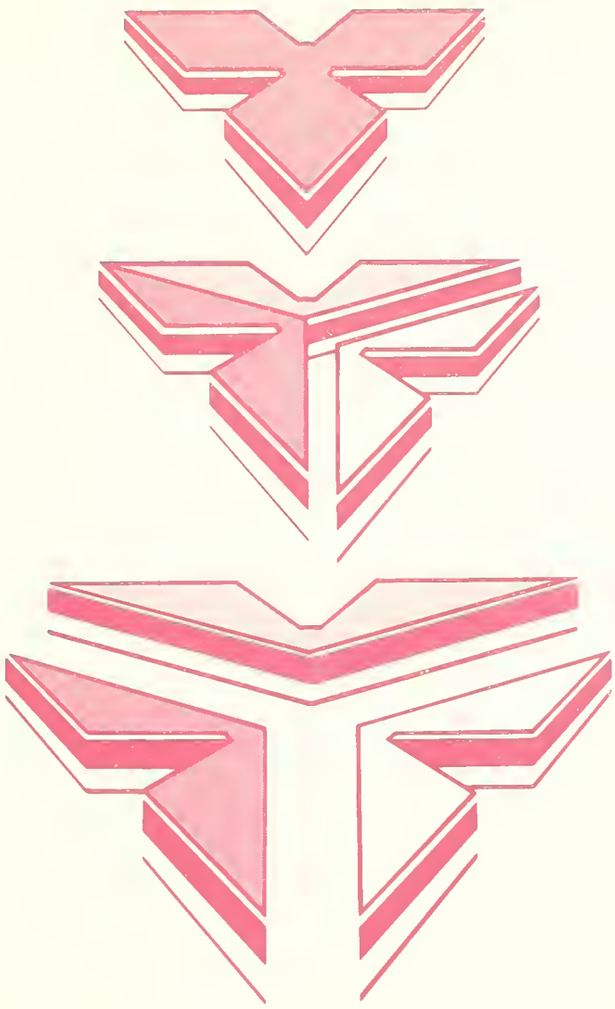

RESEARCH REPORT No.4

Market vs. Non-Market Investments

Andersen Economic Research Ltd., 1987

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Task Force on the Investment of Public Sector Pension Funds

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MARKET VS. NON-MARKET INVESTMENTS

RESEARCH REPORT #4

Prepared by:

Andersen Economic Research Ltd.
July, 1987

Ontario Task Force on the Investment of
Public Sector Pension Funds

RESEARCH REPORT #4

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1.0 INTRODUCTION

This Report provides the Task Force on the Investment of Public Sector Pension Funds with the implications, advantages and disadvantages of a possible shift of the investments of the Teachers' Superannuation Fund (TSF), Public Service Superannuation Fund (PSSF) and Superannuation Adjustment Fund (SAF) from non-marketable to marketable securities.

The section dealing with the impact on the borrower, i.e. the Province, assesses the impact of such a shift on the cost and availability of funds for the Province of Ontario and for Ontario Hydro. It also considers the Province's options in raising the equivalent requirements through traditional channels. Borrowing cost differentials have been examined where appropriate and feasible. Quantifications are estimates and do not have accounting accuracy.

The section dealing with the impact on the lender, ie. the TSF, PSSF and SAF, addresses the issue of whether the investment performance of the TSF, PSSF and SAF might have been better if the assets had been invested in a diversified marketable portfolio rather than in a fixed portfolio of non-marketable, long term Government of Ontario bonds.

The benefits and costs of a shift from non-marketable to marketable securities are considered. Estimates are made for the differences in return and risk between non-marketable and marketable. Risk is considered in a comprehensive manner. Market risk, default risk, inflation risk, liquidity risk and

independent return risk are analysed for non-marketable and marketable securities.

Rate of return comparisons are made with historical performance as an indicator. Quantifications are made of the rates of return that would have been attained if a matching pattern of net inflows had been invested in a diversified portfolio. These calculations are hypothetical and do not indicate what would have actually happened to the non-marketable funds if a real life shift to marketable securities had taken place in the past. Had such a strategy been undertaken, the investment performance of the funds would probably have been different and hence, the pattern of unfunded liability payments would in all likelihood have differed from the record as it exists now. The calculations which have been made are merely simulations on funds that had the same inflow characteristics as the TSF, PSSF and SAF.

Other issues examined include the benefits and costs to the stakeholders, the pension deal and benefits and costs associated with economic/accounting considerations.

2.0 SUMMARY AND CONCLUSIONS

2.1 STUDY SUMMARY

- The Province of Ontario presently finances all of its requirements from internal sources. However, neither cost nor availability of debt to the Province appear to constitute a constraint on shifting the public sector pension funds to marketable securities.

- At the present time there is a surplus of available captive financing for the Province and the prospects into the early 1990's are for the financing requirements of the Province to remain well within its internal financing requirements. Longer term prospects are less certain but no availability problems are anticipated. Ontario Hydro net financing requirements are expected to decline into the mid-1990's.

- The Province could once again access both Canadian and international public capital markets in order to replace the captive financing of the public sector pension funds. In addition, these pension funds would still remain financing sources for the Province. The Province, for example, could undertake private placements with the public sector pension funds.

- The Province could also use currency swap markets to borrow without exchange risk in expanding international capital markets.

- Debt management costs of the Province could actually be reduced by a shift to a marketable investment approach by the pension funds. The public market offers less costly financing to the Province than the current procedure for non-marketable borrowing. The Province could reduce borrowing costs through a greater flexibility in both timing and terms. Increased liquidity for Ontario securities might also be expected to narrow interest rate spreads between Government of Ontario bonds and Government of Canada bonds. No adverse impact on Ontario Hydro's financing costs are expected.

- Simulations of the contribution and unfunded liability flows of the TSF, PSSF and SAF indicate that for such hypothetical calculations, the returns for these funds are lower by at least 200 basis points compared to other diversified marketable public sector funds.

- Such an increased investment return could be achieved without an increase in market risk as measured by the volatility of investment return. Liquidity and inflation risk would both be reduced by a shift from non-marketable to marketable. Liquidity risk is the highest for non-marketable investments. Inflation risk is the highest for long term bonds. Long term bonds show the greatest frequency of negative real investment returns (13 out of 25 years).

- For the employee contributors to the TSF, PSSF and SAF, if doubts were to exist as to the future ability of the Province to honour its pension committments, current and future beneficiaries might derive a degree of comfort from the knowledge that the assets were invested in marketable securities earning the most efficient mix of return and risk. For the borrower, ie. the Province and ultimately the taxpayer, an improved investment return would decrease or eliminate the need for unfunded liability payments.[1]

- Since the costs of low investment returns on the TSF, PSSF and SAF are the sole responsibility of the Government, it would seem reasonable to conclude that the benefits of an improved investment performance should accrue solely to the Government.

- If a shift from non-marketable to marketable were undertaken, there would no longer be a perfect matching of assets between lender and borrower. This would create an opportunity for an independent return and an independent return risk. Under a defined benefit pension deal, all of this risk would be the responsibility of the sponsor. Hence, the Government, bearing all the additional risk, should be entitled to the additional return.

- Provincial borrowing exposure abroad would produce an "information effect" for Ontario corporate borrowers which might increase the marketability of Canadian securities.

- The appearance of conflict of interest between lender and the sponsor would be eliminated by a marketable investment management strategy for the public sector pension funds.

1. An actuarial surplus which results from an increase in investment return would be shared with employees if lower contributions are paid. This sharing occurs because of the matching contributions policy.

2.2 STUDY CONCLUSIONS

2.2.1 Implications for Plan Members

- The level of pension benefits should not be affected by a shift to marketable securities. The benefits in the current "pension deal" are independent of investment performance.

2.2.2 Implications for the Province (i.e. Tax Payers)

- A shift from non-marketable to marketable securities would provide the Province with greater debt management flexibility.

- Such a shift could also provide the opportunity for the funds concerned to earn a rate of investment return some 200 basis points higher than that earned under the present system.

2.2.3 Implications for the Province (as Legislator/Regulator)

- The Province would gain increased credibility if it played by the same rules as any private sector employer would.

3.0 BACKGROUND

At the present time four pension funds - the TSF, PSSF, SAF and CPP - are a source of internal funding for the Province of Ontario. The non-public funds available to the Province are currently in excess of the Province's net borrowing requirements. The only public market borrowing currently undertaken by the Province is for the foreign borrowing needs of Ontario Hydro.

3.1 BORROWING/LENDING ARRANGEMENTS

3.1.1 Teachers' Superannuation Fund, (TSF)

The TSF is a contributory defined benefit plan with contributions made by the future beneficiaries and matching contributions by the Province of Ontario. The TSF invests virtually all of its surplus funds in long term, fixed-rate, non-callable and non-marketable Government of Ontario debentures.

As of March 31 1987, the TSF held just over $10 billion in non-marketable Ontario debentures. The investments of the TSF are managed and administered by the Teachers' Superannuation Commission under the Teachers' Superannuation Act and the Pension Benefits Act of Ontario. The Government of Ontario acts simultaneously as the legislator of the TSF, its sponsor, the guarantor of its benefits and the issuer of debt for plan investments.

According to Section 72 of the revised Teachers' Superannuation Act, 1983, the TSF debenture "shall bear interest payable half-yearly at a rate based on the Canadian secondary market when the debenture is issued for Ontario securities, securities guaranteed by Ontario and other similiar securities,

or any of them, with a term corresponding to the term of the debenture." In addition, "the term of a debenture ... shall be not less than twenty years and not more than twenty-five years."

In the 1971-72 to 1982-83 period the TSF interest rates were based on the weighted average yield on new issues of the Province and Ontario Hydro securities issued in the previous fiscal year. Since 1983-84, the interest rate paid has been based on the three most recently issued Ontario/Hydro bonds trading in the Canadian secondary market, quoted on the first three business days of the month. An additional one eighth of a percent was added, as before, to reflect savings in transfer costs.

Through the Pension Benefits Act, 1965, pension plans for all Ontario public sector employees have come under the jurisdiction of the PBA. As a result the TSF as well as the PSSF and the SAF, though governed by their own Acts, are required to comply with the funding and solvency provisions of the Pension Benefits Act and its regulations.

Also, under the Pension Benefits Act of Ontario, the Province of Ontario (the sponsor of the plan) is required to fully fund the benefits determined under the plan.

3.1.2 Public Service Superannuation Fund, (PSSF)

The Public Service Superannuation Act, 1985, stipulates that a Fund known as the PSSF shall be maintained under the provision of the Provincial Treasurer. The Treasurer is the custodian of the Fund. The PSSA makes no provisions on how or where the funds may be invested. It merely stipulates that interest shall be credited at the close of each year. Such credits to the Fund from

the Consolidated Revenue Fund are at a rate determined by the Lieutenant-Governor in Council. On March 31, 1987 the PSSF balance amounted to $4.6 billion.

The interest rate on PSSF investments is determined by the Treasurer. In 1973, a formula was developed whereby the interest rate paid was equal to the weighted average yield of new bonds issued or guaranteed by the Province in Canadian dollars during the prior fiscal year. Since 1982-83 a contemporaneous rate setting formula has been used whereby the interest rate equals the weighted average yield to maturity on the three most recently issued Ontario (or Ontario guaranteed) long term securities outstanding in the Canadian secondary market. These securities are to have an original term to maturity of 20 years or more and a remaining term of 18 years or more.

This average is weighted by the amount of securities outstanding and is measured over the first three business days of the month. One eighth of one percent is added to reflect Ontario's savings in administrative and issuing costs. This interest rate is applied in the current fiscal year to new money entering the Fund during that year.

The PSSF is not segregated from the Provinces' assets but flows into the Consolidated Revenue Fund. The amounts recorded by the Province are book entries and are essentially the sole assets of the plan. The SAF is treated in a similar manner. As no securities are issued, the PSSF and SAF borrowing is classified as "unfunded" borrowing. In the Provincial Accounts, PSSF and SAF borrowing is reported as part of non-budgetary transactions and is thereby used to reduce net cash requirements.

3.1.3 Superannuation Adjustment Fund, (SAF)

The purpose of the Superannuation Adjustment Benefits Act (SABA) is to "provide superannuation adjustment benefits to persons in receipt of pensions payable out of pension funds indirectly out of the Consolidated Revenue Fund". The Act provides for indexing to the Consumer Price Index and sets up the Superannuation Adjustment Fund (SAF) for the PSSF as a separate account in the accounts of the Province of Ontario. On March 31, 1987 the SAF balance for the PSSF amounted to $0.4 billion.

The Treasurer is the SAF custodian. The Fund consists of the monies paid in by the contributors and interest earned, less monies paid to beneficiaries. Interest is credited to it at the end of each fiscal year from the Consolidated Revenue Fund at a rate determined by the Lieutenant Governor-in-council. SABA makes no provisions on how or where the SAF monies may be invested.

Until 1984-85, the interest rate paid on SAF funds were calculated on the basis of secondary market yields of Ontario Hydro or Government of Canada bonds in Canadian capital markets measured over the first three business days of the month. One eighth of one percent is added to the annual average rate as an allowance for transactions costs. The SAF's monies are borrowed for a fixed term that varies between one to twenty years.

3.1.4 Canada Pension Plan, (CPP)

The Canada Pension Plan Act is a federal statute. Under the Act, all surplus funds in excess of current needs to pay benefits and administer the Act are returned to the provinces for their capital investment programs. Provincial borrowing from the CPP is

in the form of 20-year, fixed rate and non-marketable debentures. The interest rate is determined by the weighted average yield on outstanding long term Canada bonds with a remaining maturity of 20 years or more in the first three business days of the month. This rate is applied to CPP borrowings in the subsequent month. When CPP interest rates are adjusted for rate distortions present in the current rate formula and for non-callability of CPP debentures, they are roughly the same as Ontario's cost of comparable borrowing in public markets.

The funds available to the Province from the CPP have been in excess of the Province's need for funds (after financing from the TSF,PSSF and SAF) since the early 1980's when Ontario's financing requirements began to decline partly as a result of the slowdown in capital investment for schools and hospitals. This coincided with rapid growth in Ontario's non-public sources of funds (TSF, PSSF and SAF). Though CPP funds are not earmarked for any specific purposes, CPP and other borrowed funds have been generally used to finance capital investment.

Though CPP funds are normally less expensive than TSF funds, the Province is required by legislation to borrow all TSF funds. As a result, the Province declined to borrow $1.1 billion of CPP funds during 1986-87. Ontario would appear to face continuing excess CPP availability if Ontario's net cash requirements remain at or below the 1986-87 level of $1.3 billion. The 1987 Ontario Budget projects that net cash requirements will be $0.980 billion in 1987-88.

3.2 PERFORMANCE

The investment performance of the TSF, PSSF and SAF is examined in this section. There are a number of measures of investment performance for financial portfolios. Rate of return measures fall into two categories - return on book value and return on market value. The choice depends on the application and is discussed in the Appendix. Rate of return must also be considered in relation to risk. We have also estimated the risk/return performance of these funds.

Estimates of time weighted market rates of return have been calculated over the past 5, 10 and 20 years and are shown in the following tables. A number of assumptions are required in order to calculate market value rates of return for non-marketable portfolios and it is important that these assumptions do not bias our conclusions. Such assumptions are also discussed in the Appendix.

Risk on an individual asset can be measured by the standard deviation of its earnings over time. The riskiness of a completely non-diversified portfolio composed of a single asset type can be measured by the standard deviation of the portfolio.

One method of estimating risk/return performance applicable to undiversified portfolios, the Sharpe Method, relates the rate of return earned above the risk free rate, ie. the Treasury Bill rate, to the total risk of the portfolio as measured by the standard deviation of the portfolio's earnings. The Sharpe ratio shows the return premium above T-Bills produced per unit of total portfolio risk and the formula is shown below. The risk free

return is the yield on Government of Canada Treasury Bills. The higher the Sharpe ratio, the better the return relative to the risk associated with earning the return.

$$\text{Sharpe Risk/Return Ratio} = \frac{\text{Return on Portfolio - Risk Free Return}}{\text{Standard Deviation of the Portfolio}}$$

3.2.1 Market Value Rate of Return

The table below shows the time weighted market value rates of return and the risk/return ratios for the TSF, PSSF and the SAF over three selected historical time periods.

	TSF	PSSF	SAF
		Per Cent	
20 Years (1966 to 1985)			
Average Rate of Return	7.43	7.04	n.a.
Standard Deviation	13.42	13.55	n.a.
Sharpe Risk/Return	-.0692	-.0974	n.a.
10 Years (1976 to 1985)			
Average Rate of Return	12.00	11.82	14.90
Standard Deviation	16.67	16.64	17.76
Sharpe Risk/Return	.0582	.0473	.2176
5 Years (1981 to 1985)			
Average Rate of Return	18.97	18.54	19.96
Standard Deviation	18.39	17.74	19.03
Sharpe Risk/Return	.3749	.3639	.4140

3.2.2 Performance Issues

The market value return and risk/return measures show a wide variation in performance over the various time periods. The rate of return increases substantially as the time period is shortened to the last 10 years and the last 5 years. This reflects the sharp increase in bond prices from the troughs reached in 1981. Differences in timing and in maturities account for variations in return performance for the three funds across common time periods.

A striking performance result shown in the table above is the relatively poor performance of the non-marketable funds relative to a risk-free return over the longer term of the last 20 years. This is shown by the negative Sharpe Ratios for the TSF and the PSSF. Both the TSF and the PSSF earned rates of return which were less than the short term Treasury Bill rate over the period 1966 to 1985. Even over the medium term of the last 10 years, the return premium of the TSF and PSSF above Treasury Bill yields, per unit of total portfolio risk, is relatively low as can be seen by the low values for the Sharpe Ratio for the TSF and PSSF over this period.

4.0 CAPITAL MARKETS

4.1 MARKET INVESTMENT CONCEPTS

One of the tenets of portfolio theory is that the risk embodied in any single asset held in isolation will differ from the risk associated with that asset when it is held as part of a portfolio. Active diversification within a portfolio can reduce company specific or unsystematic risk. When a portfolio has been diversified to the extent that it is no longer possible to reduce such risk, the only remaining risk in that portfolio will be the risk inherent in the market, ie. non-diversifiable risk.

An efficient portfolio is the combination of assets which provides the highest possible expected return for any specified degree of risk or, alternatively, the lowest risk possible for any specified rate of return.

Portfolio theory distinguishes between two major classes of risk - diversifiable and non-diversifiable risk. Diversifiable risk (also called company specific or non-systematic risk) can be minimized through diversification. It includes risks connected with individual securities such as default, lawsuits, bankruptcies, etc. Non-diversifiable risk (also called market risk or systematic risk) is the risk inherent to all assets in a portfolio since all assets in an economy are subject to some of the same influences such as the economy and government measures.

4.1.2 Types of Risk

The types of risk which have been identified for consideration in the issue of whether or not to shift public sector pension funds from non-marketable to marketable are default risk, market volatility risk, liquidity risk and a risk factor which can be called "matching" or "independent return" risk. Default risk would be classed as being a component of diversifiable risk. The other risk components would be included in the general category of non-diversifiable risk.

An important part of this study will be to determine the differences in risk between the alternatives of non-marketable and marketable investment for Ontario public sector pension funds. One could conceptually think of a two-column grid with the following rows:

	NON-MARKETABLE (Higher or Lower ?)	MARKETABLE
DEFAULT RISK		
MARKET VOLATILITY RISK		
INFLATION RISK		
LIQUIDITY RISK		
INDEPENDENT RETURN RISK		

4.1.2.1 Default Risk

Default risk could, but need not be, higher for a marketable investment policy compared with a non-marketable one. Diversification does not imply more default risk. The Pension Benefits Act gives a clear indication of the degree of such risk that can be taken on by diversified funds.

4.1.2.2 Market Volatility Risk

The market volatility risk for a non-diversified portfolio is measured by the standard deviation of the portfolio. Non-diversified funds such as the TSF, PSSF and SAF embody a high degree of risk. Bonds show the highest market risk of any of the securities measured by the McLeod Young Weir (MYW) Investment Return Indices. The MYW measure of risk used is the standard deviation of the total market value investment return for specific security categories. The MYW data shows that even a limited diversification of the Ontario public sector pension funds to include Treasury Bills along with long term bonds would greatly reduce market risk. Market volatility risk would therefore be lower for marketable compared to non-marketable.

4.1.2.3 Inflation Risk

Inflation risk refers to the impact that unanticipated inflation can have on the market values of investment securities and the value of a portfolio. Inflation risk affects both the level of return and the volatility of return. Inflation risk can be quantified by calculating the inflation adjusted real rates of return for selected categories of investment securities. Money market instruments and mortgages tend to be the best hedges against inflation with the lowest frequency of negative real investment returns. Long bonds, on the other hand show the highest inflation risk of any security. Inflation risk would therefore be lower for marketable compared to non-marketable.

4.1.2.4 Liquidity Risk

Liquidity risk reflects the cost of being unable to react to either anticipated or unanticipated circumstances. Liquidity risk would therefore be greatest in a non-marketable fund dedicated exclusively to long term fixed income securities. Liquidity risk would be lower in a portfolio that could sell assets and re-direct contributions, and the proceeds from asset sales, into other categories of assets. Liquidity risk would therefore be lower for marketable compared to non-marketable securities.

4.1.2.5 Independent Return Risk

In the non-marketable situation which now exists for the TSF, PSSF and SAF, the assets of the funds are also the liabilities of the Province. Because of this matching of assets and liabilities there is no leeway for an independent return to develop between the fund's assets and the Provinces liabilities. An increase in non-diversifiable risk for the fund, for example, an increase in the volatility of the fund's investment return, would be exactly offset by a reverse volatility in the liabilities of the Province. In the non-marketable case, therefore, there would be a zero independent return risk.

If the non-marketable funds were changed to marketable funds, the assets of the fund would no longer be the mirror-image liabilities of the Province. In this case, if unexpected market conditions were to cause investment performance of the funds to deteriorate, there would be no offsetting reduction in borrowing costs to the Province. A shift to marketable securities, therefore, would involve a higher risk of independent return.

4.1.2.6 Summary of Relative Risk

A shift from non-marketable to marketable would therefore appear to involve changes in the level of risk. The following grid summarizes the effect on risk of shifting from non-marketable to marketable.

	RELATIVE RISK	
	NON-MARKETABLE	MARKETABLE
DEFAULT RISK	same or lower	same or higher
MARKET VOLATILITY RISK	higher	lower
INFLATION RISK	higher	lower
LIQUIDITY RISK	higher	lower
INDEPENDENT RETURN RISK	zero	higher

All categories of risk would be either neutral or lower as a result of a shift to marketable with the one exception being independent return risk which would be higher. There would appear to be some scope for the funds to take on more risk as the independent return risk is zero at present and all other risk elements would be neutral or show declining risk with a shift to marketable.

5.0 IMPACT ON THE BORROWER

5.1 BORROWING REQUIREMENTS

In recent years, the Government of Ontario's net cash requirements have for the most part been met through non-public borrowing, ie. the CPP and the TSF. The PSSF and the SAF have also played a major role in eliminating public borrowing, though in the Ontario accounts, monies from these funds are treated as a non-budgetary revenue item rather than non-public source of borrowing.

ONTARIO BORROWING REQUIREMENTS

	Fiscal Years				
	1983	1984	1985	1986	1987*
	($ millions)				
NON-PUBLIC BORROWING					
Canada Pension Plan	1,236	1,201	1,134	1,214	232
Teachers' Superannuation Fund	945	786	1,065	1,235	1,310
Retirements	84	10	11	31	343
Net Non-Public Borrowing	2,097	1,977	2,188	2,418	1,199
PUBLIC BORROWING					
Debenture Issues	0	0	500	0	0
Treasury Bills	0	0	650	0	0
Retirements	62	46	267	98	316
Net Public Borrowing	(62)	(46)	883	(98)	(316)
NET CASH REQUIREMENTS	2,478	2,289	1,702	2,110	1,349
Change in Liquid Reserves	(427)	571	388	(8)	(156)
Borrowing from PSSF and SAF	531	559	597	659	723

* Estimated

SOURCE: Province of Ontario Treasury Department

Since the early 1980's Ontario's rapidly growing non-public sources of funds began to exceed Ontario's borrowing needs. Slow growth in Ontario's financing requirements reflected a diminished need for schools and hospitals. Ontario, as a result, has refrained from public borrowing in four out of the past five years and has met its net cash requirements from non-public borrowing. The Province of Ontario does not borrow on the public market on its own behalf at all. The Province does, however, borrow outside Canada on behalf of Ontario Hydro. Hydro borrows on its own behalf within Canada and the Province has left the Canadian public market free for the financing needs of Ontario Hydro.

5.1.2 Government/Ontario Hydro

The Province of Ontario and Ontario Hydro have historically had a close association in financing their borrowing requirements. The Province undertakes to carry out the U.S. borrowing and the C.P.P. borrowing on behalf of Ontario Hydro. In domestic capital markets and in other foreign markets, Ontario Hydro borrows in its own name but almost always with the Provincial guarantee. The Province borrows on behalf of Hydro in the U.S. for historical reasons and from the C.P.P. for legislative reasons.

The withdrawal of the Government of Ontario from the public market had its beginnings in the mid 1970's which was a time of aggressive Hydro expansion plans. At that time the Province shifted its focus of financial control from the budgetary deficit

to net cash requirements. The policy intent was to restrain public borrowing by the Province and to leave more room in the public market for the large financing requirements of Ontario Hydro.

The declining capital requirements of the Province and the rapid growth of non-public sources of funds from the superannuation accounts have meant that the Province continues to leave the public market for the borrowing needs of Ontario Hydro. The borrowing requirements of Hydro have, however, changed abruptly in the 1980's.

Ontario Hydro's last study of long range financial requirements published in December 1986, "Long-Range Financial Projection 1986 - 2006", shows a pronounced decline in capital spending and borrowing requirements into the mid-1990's. Construction activity is forecast to decline substantially as Darlington NGS is completed. The Report states that construction activity in the reference case is projected to remain below the 1986 level until the mid-to-late 1990's. The "most likely" economic scenario in the Ontario Hydro projections foresees relatively low real net borrowing conditions until the late 1990's. Borrowing is forecast to increase in the late 1990's as the result of the financing requirements of as yet uncommitted construction projects. The Hydro study concludes that:

> "Over most of the projection period (1986 - 2006), funds from principal capital markets are expected to be sufficient to finance Ontario Hydro's borrowing requirements. Under most scenarios all borrowing requirements are expected to be met by a combination of Canadian dollar issues and fully hedged foreign currency issues. However, there is a risk that a

sufficient amount of hedges will not be available to cover the relatively high foreign borrowings required under the high growth scenario."

These projections suggest that a shift from non-marketable to marketable securities by the TSF, PSSF and SAF would have little if any impact on Ontario Hydro's capacity to finance its requirements and conduct debt management in the 1990's.

5.1.2.1 Availability

There is a distinction between the availability of funds and the cost of funds. In this section we will focus on availability. Cost differentials will be considered later.

Given existing sources of non-public borrowing, the Province's financing requirements are well within its internal financing capabilities. Financing requirements for the 1986-87 fiscal year were $1.311 billion and the CPP alone provided a potential financing availability of $1.1 billion. The Province could have financed almost all of its financing requirement from the CPP alone. At the present time Ontario turns down most of the available financing from the CPP because it is required to borrow from the TSF. Ontario is now at the point where the availability of internal funds exceeds the Province's financing requirements. This is likely to continue if net cash requirements remain around the 1986-87 level of $1.3 billion. PSSF and SAF contributions are required to be deposited with the Province thereby reducing the financing requirement. The 1987 Ontario Budget projects 1987-88 net cash requirements of $980 million and indicates that all of this amount will be financed by the TSF.

A shift from market to non-market would appear to have no impact on the availability of funds for the Province of Ontario. There does not appear to be a risk of an availability problem in the near future either. Ontario Hydro is at the present time facing declining capital outlays and the Province's energy policy has moved away from capital intensity towards demand management. There would appear to be no shortage of public funds in the 1990's for Ontario.

The introduction of a marketable investment policy by the public pension funds, given current circumstances in capital markets, would therefore not appear likely to precipitate a shortage of public financing. From an availability point of view there would seem to be no constraint in shifting the net cash flow of all non-marketable pension funds to marketable securities right away.

Even if in the more distant future, Ontario Hydro were to again formulate aggressive expansion plans, availability does not appear to be an issue. Capital markets will be larger than they are now. Funds would still be available from the public sector pension funds in the public market. Private placements could be undertaken with the public sector funds if they were shifted to marketable securities.

Foreign markets would also be available to finance the Province's borrowing needs. In contrast to the global capital market, the Canadian market is quite small. Canada rates highly

as a credit in the world market and Ontario is close behind. Relatively small increases in interest rate spreads can attract significant flows of foreign funds to Canada.

The availability of debt capital to the Province of Ontario or to Ontario Hydro appears to be a non-issue. A more relevant consideration is whether there are limits to the amount of capital which Ontario could borrow without affecting interest rate spreads between Government of Ontario securities and comparable Government of Canada securities. The real issue therefore is whether the cost of borrowing for the Province would be higher, the same or lower as a result of a shift to a marketable investment approach by the TSF, PSSF and SAF. This matter is discussed below.

5.1.2.2 Options

The most obvious option available to the Province if a shift from non-marketable to marketable securities is undertaken by the Ontario public sector pension funds, is to re-direct borrowing from the non-public market to the domestic public market. The domestic Canadian capital market is growing rapidly as a result of continuing economic growth, more stable inflation, high rates of personal saving, government restraint on budgetary deficits, the continued development of financial markets and the strong growth of private sector pension funds. The Province of Ontario is a prime credit among the provinces and Ontario would no doubt be able to re-enter the domestic public debt market for significant financing.

Foreign markets could be developed further as a source of Provincial financing if required. The Province does not need the TSF, PSSF and the SAF as a source of financing because the world capital markets, including Canada, could act as a significant substitute market to provide funds from alternative sources.

Hydro has not used any overseas markets in the last three years. Foreign capital markets are, however, growing rapidly and are being widely used by other Canadian borrowers, eg. the Euro, United States and Japanese markets. In addition the development of currency swap markets has fundamentally changed the foreign exchange risk environment. This innovation could potentially open up the global capital markets to the Province of Ontario.

At the present time, the Province is not participating in this internationalization of capital markets. The cost of raising funds through this foreign market alternative would not appear to involve significant increases in in interest rate spreads for Ontario debt and may offer cost savings in comparison with conventional domestic issues.

5.1.2.3 Costs

In 1983 the TSF, PSSF and SAF moved to an interest rate setting formulae based on current year interest rates. These formulae are described in Section 3.1.1 above. The old formulae linked the Province's borrowing rate to the previous year's interest rates. Recent evidence indicates, however, that the public market provides a more competitive, lower cost financing

CPP. Based on historical experience since 1983, the Province would have been able to borrow in the public market at rates more than 100 basis points lower than TSF borrowing. Detailed comparisons are shown in the table below.

INTEREST COSTS ON ONTARIO AND HYDRO BORROWING IN CANADA
Calendar Year, Per Cent

	Public Market	Non-Public Sources TSF	Non-Public Sources CPP	Public Market Compared to: TSF	Public Market Compared to: CPP
1977	9.47	9.99	9.15	-0.52	0.32
1978	9.64	9.68	9.62	-0.04	0.02
1979	10.20	9.65	10.23	0.55	-0.04
1980	13.31	10.39	12.74	2.91	0.56
1981	13.59	12.23	15.07	1.36	-1.48
1982	14.89	14.53	15.07	0.36	-0.18
1983	11.15	14.19	11.58	-3.04	-0.43
1984	12.54	13.30	13.25	-0.76	-0.71
1985	10.79	12.07	11.64	-1.28	-0.84
1986	9.32	10.67	10.25	-1.35	-0.93

	Public Market	Non-Public Sources TSF	Non-Public Sources CPP	Public Market Compared to: TSF	Public Market Compared to: CPP
Averages					
77/81	11.25	10.51	11.56	0.73	-0.32
82/86	11.46	12.72	12.80	-1.26	-1.34
77/86	11.40	12.00	12.20	-0.61	-0.81

The calculations shown above supplied by the Ontario Treasury Department on the weighted average cost of borrowing show that the public market is now cheaper than non-marketable borrowing by the TSF or CPP. From 1982 to 1986 borrowing costs on the public market were 125 basis points lower on average than the cost of non-public borrowing via the TSF.

While the shift to more expensive TSF borrowing compared with the public market co-incides with the introduction of the new rate setting formulae in 1983, the unfavourable cost differential is not solely attributable to this. Flexibility in timing and term also make the public market less expensive for Ontario Hydro. The Province is required to borrow monthly at the first day of each month whereas Ontario Hydro bases its borrowing on market conditions and not the administrative requirements of the TSF. In addition, the Province is required by legislation to borrow from the TSF via long term instruments while Ontario Hydro is free to borrow at different maturities and thereby possibly benefit from interest rate swings.

It appears then that Ontario could replace the funds borrowed from the TSF at a considerably lower cost.

In addition, a marketable diversified portfolio approach would give a Provincial debt manager more flexibility in maturities, thereby probably reducing borrowing costs over time. If at some future date interest rates should appear to be declining, an appropriate strategy for the Province to follow as a borrower would be to issue debt with shorter maturities. This would allow old debt to be rolled over quickly into new debt at lower interest rates. Such flexibility in debt management could be expected to result in a significant saving in financing costs.

A shift from non-marketable to marketable for the public sector funds would also increase the supply of publicly held outstanding Government of Ontario bonds. The result could be

expected to be a more liquid market in Government of Ontario securities. A more liquid market for such securities would improve Provincial debt management operations.

A broader market in Province of Ontario securities in foreign capital markets would also provide an "information effect" in these markets for the state of the Ontario economy. As a result, externalities would appear as corporate borrowers could expect to benefit from more favourable international exposure.

As a result of the above considerations, it appears that a shift from a non-marketable to a marketable investment approach for the Ontario captive pension funds could actually reduce debt management costs significantly for the Province of Ontario and conceivably could benefit corporate borrowers as well.

6.0 IMPACT ON FUNDS

This section of the Report addresses the issue of whether the investment performance of the TSF, PSSF and the SAF would be improved if the contributions were invested in a diversified, marketable portfolio rather than in a fixed portfolio of non-marketable, long term Government of Ontario bonds.

6.1 RETURNS/RISKS

It is not possible to estimate with certainty how, in the future, return and risk measures for the TSF, PSSF and the SAF might change if an alternative diversified marketable portfolio approach were substituted for the existing non-marketable investment policy. Returns and risk will ultimately be determined by the interest rate and earnings environment of the future.

What is possible, however, is to make historical comparisons with other diversified public sector funds and to simulate historically a diversified investment strategy on net fund inflows. A number of assumptions have been made to calculate what the market value of the non-marketable funds might have been if the historical pattern of inflows had been invested in marketable securities. In addition, simulations of various diversification patterns have been calculated.

While this does not indicate what will happen in the future, a long historical time period and the segmentation of this time period into sub-periods, provides a varied history of financial and economic conditions. Comparisons in risk and return between

the funds' estimated market value performance and sets of simulated diversified/marketable portfolios, are made over time periods of 5, 10 and 20 years. Such time horizons incorporate a great variety of economic and financial market experience and should give an indication of the range of future developments.

The reader must be careful in interpreting these results, however. These calculations are highly hypothetical and do not indicate what would have actually happened to the non-marketable funds if a real life shift to marketable had taken place in the past. Had such a strategy been undertaken, the investment performance of the funds would probably have been different and hence, the pattern of unfunded liability payments would in all likelihood have been quite different from the record as it exists now. The calculations which have been made are merely simulations on funds that had the same inflow characteristics as the TSF, PSSF and SAF.

6.2 COMPARATIVE RETURNS

The Appendix to this paper discusses the concepts of rate of return and risk and attempts to make quantifications for the different public sector pension funds - both non-marketable and marketable. The Appendix shows the estimated market value rate of return for the TSF at 7.43% over the 20 year period (1966 to 1985) and at 18.97% over the latest 5 year period (1981 to 1985). More reliable time periods would seem to be the longer term 10 and 20 year time span.

Over the 20 year period both the simulated TSF and PSSF earned a lower rate of return than the Caisse de Depot. Over the last 10 years, the average rate of return for both the TSF and PSSF is below the average return of the Caisse and the Median Government Fund. The latter refers to the median return of the Pension Finance Associates study of 68 funds classified as being government sponsored.

The Caisse showed a time weighted market value rate of return some 200 basis points higher than the rate of return on the simulated TSF and PSSF over the 20 year time period 1966-1985 The Median Government Fund showed an average return which was more than 200 basis points higher than the simulated TSF and PSSF over the 10 year period 1976-1985.

Over a longer period, therefore, comparable diversified portfolios appear to have provided superior investment returns than the non-diversified Ontario public sector funds which are exclusively dedicated to long term non-marketable fixed income investments.

Looking at non-diversifiable or market volatility risk, the volatility of the rate of return indicated that the non-marketable funds were riskier than the marketable funds. This measure of risk, the standard deviation of the portfolio return, was considerably lower for the Caisse and the Median Government Fund over all three of the time periods.

The diversified funds therefore achieved greater return with less market volatility risk. When rates of return are corrected by volatility risk which is defined in Section 4.1.2, the simulated TSF and PSSF both underperform. Over the more relevant 20 year time span, the TSF and the PSSF both show negative Sharpe Ratios indicating that the return on the simulated funds was not high enough even to match the risk-free return which could be earned on Treasury Bills.

To this point, the analysis has focused on a comparison between the investment performance of the non-diversified Ontario public sector pension plans and comparable diversified plans. It is also possible to simulate historically a diversification of a captive non-marketable fund and compare the results with different diversification mixes. In this analysis, the results have been presented not in terms of per cent yield, but in terms of the dollar impact of diversification on the fund.

When the net inflows into a hypothetical pension fund with the same cash flow pattern as the TSF are diversified into a mix of investments, the value of the fund increases over a 10 year period to an extent which varies with the degree of diversification. The details of such simulations are presented in the Appendix. A hypothetical TSF Fund which saw new inflows after 1976 directed into a diversification mix of securities could have increased the value of the hypothetical portfolio to a range of $7.91 billion to $8.15 billion, depending on the specific diversification proportions. In comparison, if the new flows had been directed in a non-diversified manner over the same period

into marketable Government of Ontario bonds, the hypothetical fund would only have amounted to $7.53 billion.

This is a hypothetical calculation because the cash flows used included unfunded liability payments. In a real world situation, improved investment earnings would have reduced unfunded liability payments.

7.0 BENEFITS/COSTS

7.1 STAKEHOLDERS[1].

This Section of the paper assesses the position of the stakeholders - the plan beneficiaries and the Government or taxpayer - relative to the issue of improved investment return on the funds. If the public sector funds were to be shifted to a marketable approach, who should benefit from a different set of investment management rules - the lenders or the borrower? Would plan members and beneficiaries in "defined benefit" plans find it in their interest if the fund were to achieve an improved investment performance on their pension funds? Also, given the nature of the defined benefit contract, who suffered the loss in the past resulting from an underperformance of investment return?

It could well be that current and future beneficiaries would derive a degree of comfort from the knowledge that the funds were invested in marketable securities and earning the most efficient mix of return and risk given the nature of the fund's obligations. This is because participants in a government sponsored fund whose only investments are in non-marketable securities or "book entries" in the Government's accounts, may believe that no "real" assets exist to support the promise of benefits. As a result, the promise of a future pension benefit may be seen as being less secure than if their contributions were

1. For a more complete analysis of this issue see Don Ezra's report to the Task Force entitled, The Nature of the Pension Agreement.

invested in more conventional forms. While government itself may have every intention of honouring its pension commitments, there are instances in which other governments have altered their commitments in response to escalating pension costs.

There may however be more than a psychological impact on the contributors to the TSF, PSSF and SAF. If one were to take a total compensation point of view, it is possible that low investment return even in a non-marketable fund with defined benefits would constitute a real economic risk to plan members. Low investment returns and the resulting need for more unfunded liability payments could result in an adverse taxpayer reaction. The result could be pressure for additional fiscal restraint, and smaller wage increases for teachers and other public servants.

For the Province and ultimately the taxpayer, there would have been in the past a more tangible benefit from an improved investment return for the funds, in the form of a decrease or an elimination of unfunded liability payments. If the returns are lower on non-marketable securities, there may in the future be an renewed burden on taxpayers as a result of the need to make unfunded liability payments. There have, in fact, in the past been large unfunded liability contributions to the TSF though the fund is presently in surplus.

7.2 PENSION DEAL

The issue of the pension deal involves the question of for whose benefit the TSF, PSSF and SAF ought to be invested.

Ezra in his report to the Task Force points out that the legitimate beneficiary of a fund's investment return,

> "can only be identified by studying the nature of the pension agreement between employer and employees. Moreover, the pension agreement cannot be studied in isolation, but must be seen as a part of the total compensation paid to employees for the work they do."

Contributory defined benefit plans such as the TSF, PSSF and SAF define a level of benefit that is unrelated to the investment performance of the funds. In such plans the Government guarantees the benefits and the employee is unaffected by the investment return of the fund. The employee's benefits are not affected by either high or low investment returns. The Government, on the other hand is directly affected by variations in investment performance as it bears the responsibility of making up for inadequate investment return with unfunded liability payments in order to ensure benefit security.

Since the costs of low investment returns on the TSF, PSSF and SAF are the sole responsibility of the Government, it would seem reasonable to conclude that the benefits of an improved investment performance should accrue solely to the Government.

While employees may argue for the entitlement to share in the benefits of improved investment performance because they have shared in making contributions to the funds, the nature of the pension deal would refute this claim.

7.3 ECONOMIC/ACCOUNTING CONSIDERATIONS

The plan sponsor for the TSF, PSSF and SAF is the government. The government is also the principal employer for pension purposes for each of these funds. The financial impact on the sponsor in these cases also affects beneficiaries in their role as taxpayers. In economic terms, a high rate of return on a non-marketable fund, such as has been achieved over the past 5 years is illusory because these "assets" for, say the TSF, also represent Provincial liabilities. An improved return on the assets for the fund represent a higher cost of debt to the Province. Given the nature of the deal, where plan members do not benefit from a good fund performance, the result is a neutral economic impact overall.

In a marketable securities situation, however, the close association between the lender and the borrower is severed. The lender, ie. the fund, would diversify its holdings beyond Government of Ontario long term bonds. Higher returns to the lender would not be directly matched by higher borrowing costs to the Province. In economic terms, in this case, an improvement in investment performance by the fund would represent a real economic impact. The Government's pension liability might be able to be met at a lower cost to the taxpayers, given the nature of

the pension deal, provided the taxpayer withdrew any actuarial surplus which was earned.

If the non-marketable funds were to be changed to marketable funds there would no longer be a perfect matching of assets and liabilities between lender and borrower as discussed in Section 4.1.2.5 and an opportunity for an independent return would be created. The additional investment return associated with a shift from non-marketable to marketable securities is not achieved without additional risk. Under a defined benefit pension deal, all of this risk is the responsibility of the sponsor. The Government, having borne all of the risk, is entitled to all of the additional return.

7.4 OTHER CONSIDERATIONS

Confidence in the integrity of a government sponsored plan may be impaired if beneficiaries believe that a conflict of interest exists between the government's role as a plan sponsor and its role as a borrower from the plan. There will always be an issue of perception and an appearance of a conflict of interest as long as the public sector pension fund investments are solely dedicated to non-marketable Government of Ontario securities. This whole issue of a potential appearance of a conflict of interest between lender and borrower would be eliminated if the Ontario public sector funds were invested in a marketable diversified portfolio.

8.0 APPENDIX - MEASURES OF RATE OF RETURN AND RISK

This Appendix is intended to provide more background for the evaluation of the investment performance and the analysis of comparative returns of the TSF, PSSF and SAF. These issues are discussed in Section 3.2 and Section 6.1 of this study.

If the issue at hand concerns the funds actually available for current use, the return on book value would be the relevant measure. This measures realized earnings without including unrealized capital gains. There is no need to value assets at market prices for this approach.

If the issue is the ability of a fund to meet its liabilities, then market value would be appropriate because it includes unrealized capital gains or losses. The market value rate of return measures changes in asset values - dividend and interest income plus realized and unrealized capital gains or losses. In calculating such a rate of return measure, it is necessary to determine market values for all assets in the portfolio. The rate of return over the evaluation period is then expressed as a percent of initial capital value adjusted for net contributions or withdrawals.

8.1 DOLLAR WEIGHTED AND TIME WEIGHTED RATE OF RETURN

The internal or dollar-weighted rate of return of a portfolio is determined by the beginning and end-period market values of the portfolio and the timing of net contributions. This

measure of the rate of return weights the final return figure by the values of the portfolios in each sub-period. This means that even if two funds were invested in identical portfolios, a different timing in contributions would give different rate of return results. While such a measure does in fact give an exact measure of the rate of return earned on the funds invested, it is not suitable as a measurement of the performance of portfolio managers who have no control over the impact of external cash flows.

The time-weighted measure of rate of return assumes that all contributions take place at the mid-point of the time periods being used. The standard measure of portfolio return is the time weighted market value rate of return.

The Dietz formula assumes that one half of the net contributions are made at the beginning of the time period, and one half at the end of the period. The Dietz algorithm which is shown below adjusts the portfolio beginning and ending values by adding and subtracting half of the contribution, respectively.

$$\text{Dietz Rate of Return} = \left[\frac{\text{Portfolio Value at the End of Period} - \text{Half the Contribution}}{\text{Portfolio Value at the Beginning of Period} + \text{Half the Contribution}} - 1\right] \times 100$$

8.2 THE VALUATION OF THE TSF, PSSF AND SAF

The bond holdings of the TSF, PSSF and SAF have been assigned market values at the end of every evaluation period. However, it is difficult to assign a price even to marketable bonds because listed prices do not necessarily reflect the actual price of a large transaction if the securities are relatively inactive. The market values assigned to the non-marketable bonds are determined from a yield curve for outstanding Ontario issues constructed for each valuation date.

There are a number of points of vulnerability in the assignment of market values to untraded, non-marketable securities. First, the Ontario yield curve, prior to 1980 was constructed on the assumption of a constant Ontario spread relationship off the Government of Canada yield curve. The assumed spread is the average Ontario/Canada spread over the last seven years. This method also uses a yield curve based on liquid securities to obtain valuations for illiquid ones. Both of these assumptions could underestimate the yield for Ontario bonds and overstate their price.

Another consideration in the assignment of market values to non-marketable securities is the decision as to what time period to use in the calculation of time weighted rates of return. An annual time period was chosen in order to match the annual return results for the Caisse de Depot and OMERS. The choice of yearly time periods in calculating time weighted rates of return produces a higher rate of return result than would have been

obtained from a quarterly or monthly calculation. It is generally agreed that more frequent measurement periods produce more accurate returns.

The use of yearly time periods has the effect of producing conservative results (high returns for the TSF, PSSF and SAF) in the comparison of investment performance of the Ontario non-marketable public sector funds with the Caisse and other diversified public sector funds. This results from the degree of over-estimation of the time weighted rate of return results using annual time periods for the TSF, PSSF and SAF. The bias is uniformly one way and favours the returns shown for the non-marketable funds. As a result, this bias results in a favourable comparison with the other funds.

8.3 COMPARISONS WITH MARKETABLE PUBLIC SECTOR FUNDS

The performance measures for the TSF, PSSF and SAF are compared below with diversified pension funds, such as the Caisse de Depot, the Median Government Fund and the Ontario Municipal Employees' Retirement System (OMERS), which are invested in marketable securities. The comparison with OMERS is not as relevant as with the others, however, as the OMERS results are still influenced by holdings of non-marketable bonds which are a carry-over from when all of the OMERS fund was invested in non-marketable Ontario debentures.

TIME WEIGHTED MARKET RATES OF RETURN

	TSF	PSSF	SAF	Caisse	Median Govt	OMERS
				Per Cent		
Average Return (Geometric)						
20 Year	7.43	7.04	n.a.	9.36	n.a.	7.30
10 Year	12.00	11.82	14.90	13.50	14.31	12.47
5 Year	18.97	18.54	19.96	15.79	15.20	16.05
Standard Deviation						
20 Year	13.42	13.55		9.38		11.04
10 Year	16.67	16.64	17.76	9.17	6.04	11.19
5 Year	18.39	17.74	19.03	11.85	8.00	11.43
Sharpe Risk/Return						
20 Year	-.0692	-.0974		.1064		-.0957
10 Year	.0582	.0473	.2176	.2692	.5430	.1289
5 Year	.3749	.3639	.4140	.3128	.3893	.3476

Over the 20 year period from 1966 to 1985 the TSF and PSSF both earned a lower rate of return than the Caisse. Over the last 10 years the TSF and the PSSF both fall below the average rate of return of the Caisse and the Median Government Fund. Over the last five years, all three of the pension funds dedicated to non-marketable long term Ontario bonds have out-performed the rate of return earned by the diversified funds.

It must be emphasized that the last five years are not likely to be a reliable guide to the future. The dramatic increase in bond prices from their trough in 1981 would not appear to be sustainable given a continuation of economic growth in North America and a stabilization and a possible increase in the rate of inflation. A more reliable time period would seem to be the longer term 20 year time span.

The Caisse showed a time weighted market value rate of return some 200 basis points higher than the rate of return on the non-marketable Provincial funds over this period.

The measure of risk, the standard deviation of the portfolio, was considerably lower for the Caisse over all three of the time periods even though these risk measures overstate the riskiness for the Caisse. The diversified funds achieved greater return with less risk.

When rates of return are corrected for risk by the Sharpe ratio, the high rates of return of the non-marketable funds compare much more closely with the diversified funds. Over the more relevant 20 year time span, the TSF and the PSSF both show negative Sharpe ratios which indicate that the return on the funds was not high enough even to match the risk-free return which could be earned on short term Treasury Bills.

Over the 10 year period, the return premium per unit of total risk was considerably lower in the non-marketable funds than in the diversified ones. For an extra unit of risk, the non-marketable funds were earning only a very small additional return above the risk free return. These funds were considerably more risky than the diversified funds with little additional payoff relative to the risk in the five year period, and worse return performance over the longer term.

It is possible that a conservative approach has been taken by comparing with the Caisse. The returns for the Caisse may have

been biased down by special factors. An important question to ask at this point is whether the Caisse is a representative fund from an earnings point of view. For the Caisse one might expect its returns to be actually somewhat lower than other diversified public sector pension funds because of its economic development orientation. Also with the formation of the Caisse still a relatively recent event (1966), start-up costs might be expected to have resulted in an underperformance of investment performance. The Caisse might have taken more fixed income assets than it otherwise would have as a result of the start-up pressures on investment management resources.

Another example of return performance for diversified public sector funds is the Pension Finance Associates' Median Government Fund which shows investment performance of some 68 diversified public sector pension funds across Canada. Another further comparison would be with a calculated average government pension fund based on the actual weightings of asset categories of diversified government funds as shown by Bank of Canada statistics and the MYW Investment Return Indices. This is an arithmetic construct but does have applicability to average public fund performance. These comparisons are shown below.

REPRESENTATIVE DIVERSIFIED PUBLIC SECTOR PENSION FUNDS

Average Rate of Return on Market Value

	Caisse	OMERS	Median Govt.	Calc. Govt.
Average Return				
20 Year	9.36	7.30	n.a.	10.57
10 Year	13.50	12.47	14.31	14.05
5 Year	15.79	16.05	15.20	17.62

* Caisse is a 19 year average

These results show that the Caisse underperformed the rate of return performance of the more representative Median Government diversified public sector fund and a "calculated" diversified government sector pension fund for the 10 year period.

8.4 A SIMULATED DIVERSIFICATION OF THE TSF

The McLeod Young Weir (MYW) total rates of return on selected investment security categories have been used to simulate a diversification of the non-marketable Ontario public sector pension funds. The Ontario Securities Commission has recognized these return calculations as being the industry standard in Canada. The Index measures market value returns since at the end of period, securities are valued as if they had been sold, ie. at the market value. The returns are "all in" total rates of return which include the re-investment of interest or dividend return, plus realized or unrealized capital gains or losses.

The MYW return indices are based on a conservative "no trading" rule and essentially represent "passive mutual funds" for the various classes of assets. The indices therefore represent the minimum standard of performance for investment management. An active trading oriented management might have provided superior rate of return results over the past five years.

The MYW earnings indices do not incorporate a default risk. No issue has ever gone into default while in the MYW Index. Issues are sold from the Index if they are downgraded.

The MYW Index prices are taken at mid-market. As a result, the prices do include one half of the bid/ask spread. The Index, therefore, partly incorporates transactions costs. The MYW rate of return estimates for various categories of investment securities over the past 5, 10 and 20 years are shown below.

COMPARATIVE TOTAL RATES OF RETURN*

	30 Day Corp Paper	3 Mo. Bills	Conv. Resident. Mortgages	MYW Long Bonds	TSE 300 Stocks
			Per Cent		
Average Return					
20 Year	9.36	8.64	9.75	8.15	10.47
10 Year	11.87	11.61	12.68	12.43	16.75
5 Year	13.36	12.93	17.02	18.31	9.40

*SOURCE: McLeod Young Weir, 1985 Investment Returns, April 1986

Over the 20 year period Dec. 1965 to Dec. 1985, long bonds show the lowest average per cent return, lower than even 30 day prime corporate paper or 91 day T-Bills. In comparison, equities recorded the highest average return. Over the last 10 years, equities continue in first place but bonds move up to surpass the return on short term securities. Over the past five years bonds move into first place and equities fall below money market instruments.

It is clear from the above market value total return indices that any one of a range of diversified market portfolios would have earned over the past 10 or 20 years a substantially higher rate of investment return than an undiversified portfolio solely dedicated to long term bonds. A rate of return average weighted by percentages for portfolio classes will give the identical result as if the weights had been beginning of period value weights for the various asset classes in a portfolio.

The annual data from the MYW return indices have been applied to the net flows into a hypothetical public sector pension plan with no marketable investments to simulate the impact that a switch from non-market to market investment diversification would have on the value of the fund. These calculations are meant to show what a hypothetical pension fund with the same cash flow pattern as the TSF could have grown to under a diversified management strategy.

This calculation is intended to extend the non-market vs. market return question beyond percentage rate of return to

estimates of potential dollar return.

It was assumed that net new inflows into the Fund after 1975 were invested into several diversified portfolios. All new money going into the fund is channeled into fixed proportions of asset categories. It is therefore assumed that existing asset holdings are not sold and that the diversification only takes place on new flows. The MYW return indices are applied to these cash flows.

The table below shows how a pension fund diversified on the following basis and with a cash flow similiar to the TSF would have performed over the last 10 years.

VALUE OF THE HYPOTHETICAL PORTFOLIO (1976-1985)
DIVERSIFIED AFTER 1975

Long Bond	TSE	Mort-gages	30-Day Corp. Paper	Value of Fund
% Distribution				$ Bill.
Long Ontarios				7.53
100	0	0	0	7.97
65	10	15	10	7.91
55	20	15	10	7.98
45	30	15	10	8.05
35	40	15	10	8.15

If at the beginning of 1976, TSF flows had been invested in a diversified mix of securities, TSF assets could have increased in value to a range of $7.91 Billion to $8.15 Billion, depending on the specific diversification proportions. A non-diversified

approach which directed the new inflows solely into marketable long term Government of Ontario bonds would have only produced a portfolio value of $7.53 Billion by the end of 1985.

Similar results were obtained for simulations of the PSSF portfolio. If the net inflow to the PSSF had been solely dedicated to marketable long Ontarios after 1975, the value of the fund would have been $3.72 Billion by the end of 1985. Diversified portfolios would have increased the 1985 value to a range of $4.23 Billion to $4.43 Billion, depending on the diversification pattern.

8.5 TRANSACTIONS AND ADMINISTRATIVE COSTS

This simulation of the investment performance of a diversified TSF and PSSF has not been fully adjusted for transactions costs and has had no adjustment for administrative costs. Since the MYW Return Indices price the various financial assets in the indices at mid-market, these indices do, in fact, incorporate at least one half of the transactions costs. In addition, the transactions costs are minimized by the assumption that a diversified TSF would involve a passively managed portfolio.

For bonds, it is likely that the transactions costs would be minimal. Equities, therefore, are the only category of security that would require some adjustment for transactions costs. In an environment of negotiated commissions, it is estimated that transactions costs would not be above five basis points.

For administrative costs, one can turn to examples such as OMERS for guidance. Over the period 1981 to 1985, administrative costs for OMERS have averaged about 5.8 basis points on a book value basis. Since market values have tended to exceed book values in recent years, these costs would be lower if expressed on a market value basis.

In general, if the differences in return are 100 to 200 basis points higher with a diversification in fund management, then 10 basis points for administrative and transactions costs represent a relatively insignificant cost element.

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